

# A CASE OF RUPTURED EMPYEMA OF THE GALL-BLADDER ASSOCIATED WITH ASCARIS LUMBRICOIDES.

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GALL-BLADDER disease in young children has always been regarded as extremely rare, hence the occurrence of a case at the early age of a little more than 2 years makes it worthy of record.

W. W., an only child aged 2½, had been in perfect health until the present illness, except that for the previous fortnight, while staying with his grandmother, he had passed two round-worms. She had remarked that he was always twitching and that she could not satisfy him with food. She also said that he was "full up with worms."

On January 26th of the present year he first showed signs of illness; on that day he went off his food and vomited everything he was given. The next day he was still unwell, but the vomiting ceased and he did not complain of any pain. On January 28th and 29th the condition was much the same; he was fretful, would not take food, but was very thirsty, drinking a lot of milk and tea. On the following day he was about the same; but no further vomiting occurred. He was seen by one of us for the first time, and some medicine was ordered. On the morning of January 31st he seemed a little better and took some bread and jam, but in the afternoon he complained of abdominal pain, and was flushed and appeared very feverish. The next day he was worse; he perspired very freely, and refused to eat or drink. There was no vomiting, but he still complained of abdominal pain. He was again examined, and it was thought that it might be a case of appendicitis. An enema was ordered, and a round-worm was passed in a good result. On February 2nd he was still disinclined to eat, and took only liquids; he was very irritable and perspired freely all day, and had five motions. About midnight he appeared very much worse, and complained of severe abdominal pain. The next morning he was ordered to hospital.

On admission the child looked ill. His temperature was 99° F., the pulse 140. He was very restless; the tongue was dry and coated, and the abdomen was rigid all over. A diagnosis of acute appendicitis with generalized peritonitis was made. Within a few hours of admission a paramedian incision below the umbilicus was made and on opening the peritoneum free pus was encountered. Examination of the appendix revealed that it was not the offending organ, and a search for a Meckel's diverticulum was also fruitless. On palpating the upper abdomen a mass was felt, and the incision was enlarged up to the costal margin. The omentum was found wrapped around the gall-bladder, from which, on freeing the

omentum, thick pus was seen to be oozing. A clamp was applied to check the pus, but the slightest traction resulted in the forceps tearing away. All attempts to prevent the pus escaping were abandoned, and it was mopped up until the gall-bladder was emptied. The common bile duct was inflamed, but nothing abnormal was revealed by palpation; it was not opened. The gall-bladder was then removed and two drainage tubes inserted, one in the region of the gall-bladder and the other into the pelvis; the abdomen was then sutured.

*After-History.*—The usual post-operative treatment was carried out, and an enema given on the second day brought away a fourth round-worm; each of these worms measured about six inches. Widal's reaction was negative, and antihelminthic treatment was carried out, but no more worms were passed. The recovery was uneventful, and the child left hospital six weeks later quite well. The pus showed a mixed infection of *B. coli*, streptococci, and staphylococci.

This case presents two interesting and rare conditions: first, the occurrence of an acute empyema of the gall-bladder in such a young child, and secondly, its association with the *Ascaris lumbricoides*. It may be of interest to review the literature of these two conditions separately.

## Acute Perforated Empyema of the Gall-bladder in the Young.

From a perusal of the literature this condition appears to be of very rare occurrence. Griffith states: "Acute cholangitis and cholecystitis are very infrequent conditions, but may occur after typhoid fever or from sepsis. Cholecystitis of a more chronic nature is probably not an infrequent sequel of typhoid fever. Tuberculosis of the gall-bladder is sometimes seen."

Reid and Montgomery of the Johns Hopkins Hospital collected eighteen cases of typhoid fever in children under the age of 15, who either died from, or were operated on for, complications arising in the gall-bladder. They preface their tabulation with the statement that "in children, acute suppurative cholecystitis of any kind is rare. Altogether there are only about twenty reported cases."

We have tabulated all the reported cases of ruptured empyema of the gall-bladder occurring in patients up to the age of 15 which we can find in the literature of this subject. It will be seen (Table I) that with the exception of the second case, in which the age is not stated, the present case appears to be the youngest yet reported.

Cholelithiasis, it will be observed, occurred in three of these cases. We have been able to trace 139 cases of this condition in which the patients were under the age of 16, and only in the above-mentioned cases was it associated with empyema of the gall-bladder. As two of these patients had also typhoid fever it may be presumed that

TABLE I.—Reported Cases of Ruptured Empyema of the Gall-bladder.

Year.	Author.	Age.	Sex.	Cholelithiasis.	Pathology.	Symptoms.	How Diagnosed.
1835	Husson	8	Unknown	No	Peritonitis; perforation of gall-bladder	Typhoid fever	Autopsy.
1852	Archambault	Infant	Unknown	Yes	Ulcerative cholecystitis, perforation of gall-bladder	Typhoid fever; peritonitis	Autopsy.
1853	Barthez and Rilliet	12	Unknown	No	Ruptured gall-bladder; large abscess	Typhoid fever	Autopsy.
1864	Chédevergne	15	Unknown	No	Ulcerative cholecystitis	Typhoid fever	Autopsy.
1882	Steadman	13	F.	No	Ulcerative cholecystitis; perforation of gall-bladder	Typhoid fever; peritonitis	Autopsy.
1882	Steadman	6	F.	No	Perforated gall-bladder	Typhoid fever; peritonitis	Autopsy.
1884	Bond	10	M.	Yes	Perforated empyema of gall-bladder	Typhoid fever	Autopsy.
1892	Treves	10	Unknown	Yes	Abscess in back from which calculus was discharged	Indigestion; vomiting	Symptoms.
1893	Chiari	12	Unknown	No	Ruptured empyema of gall-bladder	Typhoid fever	Autopsy.
1895	Alexieef	5	Unknown	No	Ruptured gall-bladder; culture <i>B. typhosus</i>	Typhoid fever; peritonitis	Operation.
1906	Dever	13	M.	No	Ruptured gall-bladder	Peritonitis	Operation.
1908	Ashurst	12	M.	No	Perforation of gall-bladder	Typhoid fever; peritonitis	Autopsy.
1922	Howze	5	Unknown	No	Acute gangrenous cholecystitis	Fever; biliary colic	Operation.
1924	Lowenberg	Child	Unknown	No	Perforation of gall-bladder; peritonitis	Typhoid fever	Operation.
1924	Bittner	9	Unknown	No	Suppurative cholecystitis; perforation	Typhoid fever	Operation.
1924	Bittner	9	Unknown	No	Suppurative cholecystitis; perforation	Typhoid fever	Operation.
1924	Bittner	11	Unknown	No	Suppurative cholecystitis; perforation	Typhoid fever	Operation.
1924	Fischer	10	F.	No	Empyema of gall-bladder	Typhoid fever	Autopsy.

TABLE II.—*Reported Cases of Ascaris lumbricoides of the Gall-bladder.*

Year.	Author.	Age.	Sex.	History of Ascariasis.	Symptoms.	Operative Findings.	Result.
1860	Heaviside and Bloch	—	—	Two cases reported, no details.			
1765	Lorry	—	—	Vomited an ascaris	Convulsions		Necropsy: 3 ascarides in gall-bladder. Cholecystostomy.
1918	Aviles	33	F.	Vomited ascaris	Gall-bladder colic	One ascaris in gall-bladder	
1920	Tyau	—	M.	Ova found in stool's	Pain and mass in gall-bladder area		Necropsy: 9 ascarides in cystic duct. Cholecystotomy.
1920	Eberle	9	M.	Treated for ascariasis	Pain and jaundice	Ascaris in gall-bladder.	
1922	Butt	30	F.	Frequently passed ascarides in stools	Biliary colic	One ascaris in gall-bladder	Gall-bladder closed without drainage.
1928	Morton	45	F.	Vomited ascaris day before operation	Gall-bladder pain five weeks	One ascaris in gall-bladder	Cholecystectomy.

cholelithiasis plays but little part in the etiology of empyema of the gall-bladder in the young.

The chief factor in the etiology of this condition is typhoid fever. It will be noted that it is the causative factor in fifteen of the recorded cases; the etiology of the remaining cases is not given. In the past typhoid fever has been very closely associated with biliary disease at all ages, but with its great decrease in recent years this condition should become still more rare. The etiology of empyema of the gall-bladder appears to depend on two conditions: (1) infection of the gall-bladder; (2) obstruction of the cystic duct, either by inflammatory oedema or by a foreign body. A. L. Wilkie has carried out some very interesting experiments on animals in regard to the etiology of gall-bladder infection. He has isolated a streptococcus from the cystic gland in the human being in 84 per cent. of cases of cholecystitis, and with the same organism has produced a similar condition in animals. He injected the streptococcus intramurally into the gall-bladder, the cystic duct being patent in one instance and ligatured in the other. In the case in which the cystic duct was occluded a chronic empyema occurred; when the cystic duct was patent a cholecystitis alone was produced. Similar results were obtained with intravenous injection of this organism. Wilkie has also shown that the bile inhibits the growth of these organisms; so it would appear that it is only when the gall-bladder has been occluded for some time and the bile loses this property that acute empyema occurs.

Non-suppurative cholecystitis in children under the age of 16 has been traced in 115 cases; the etiology in most of them has not been given. Forty-four are associated with calculi, but Potter is of the opinion that influenza, appendicitis, scarlet fever, diphtheria, etc.—in this order—can be preceding factors. Farr, who reported five cases, believes that appendicitis "is a frequent concomitant, if not an etiological factor." In four of these five cases the appendix was found to be in a pathological condition. One of his patients had had a recent attack of scarlet fever. Snyder, who reported three cases, states that in two of them there was a history of previous scarlet fever.

#### *Association of Ascaris lumbricoides with the Gall-bladder.*

The invasion of the biliary ducts by the ascaris appears from the literature to be of fairly common occurrence, but this parasite very rarely intrudes into the sanctum of the gall-bladder. There are only eight recorded cases (see Table II).

Aviles has pointed out that the pathogenicity depends on three characteristics. The first is a poison found in the extract of the worm; the second is the carrying of infection by its motile and migratory traits; the third is mechanical—the obstruction sometimes caused in a hollow viscus by a parasite or a group of parasites. The last two characteristics are of importance in considering the pathology of the present case.

It appears to be doubtful whether the ova can be hatched out in the human body. Huber says: "It may be positively affirmed that ova which contain embryos and which are still surrounded with the mulberry envelope, will develop into round-worms in the human intestine." Stiles, on the other hand, states: "The eggs of the ascaris will not hatch as long as they are in the human body. They must pass out and there undergo their changes. The young worm is developed inside the egg, the egg is then swallowed,

hatched out in the stomach, crawls through the wall of the stomach, gets into the circulation, goes to the heart and lungs, up the trachea, down through the stomach to the small intestine, there develops further." It is difficult, then, to say whether the worm develops from ova already in the biliary tract or migrates there from the intestine. Tyau has found the ova in the gall-bladder, and, if Huber's theory is true, one would expect to find the ascaris as frequently in the gall-bladder as in the bile ducts. On the other hand, if Stiles is correct and they migrate from the intestine, it is little wonder that they so rarely invade the gall-bladder when one considers the size of the cystic duct. Referring to this point Deaver says: "In a normal condition of the duct it is impossible to carry the smallest probe through it owing to its double course and the peculiar condition of its mucous lining." Tonnelé has found an ascaris partly in the common duct and partly in the duodenum. It is probable that Stiles's view is correct.

The literature is replete with reports of the presence of this parasite in the bile ducts. Huber has collected sixty-eight cases; in one as many as eighty worms had passed up from the intestine. Rokitsky reported a case of a cretin whose hepatic and common ducts were sausage-shaped, more than an inch in diameter, and filled with worms; they had found their way into the smaller ducts; two were found in the duct of Wirsung. That they may cause biliary stasis has been shown by Bounapart of Pisa, who reported a case of icterus which ended fatally, the cause of death being the presence of an ascaris in the common duct. Both ova and worms are reported as forming the nuclei of biliary calculi. Degorce reports a case of violent hepatic colic recurring for seven years; at operation many biliary calculi were removed from the common duct. The patient died six months later from pulmonary tuberculosis. At the necropsy about forty stones were found in the biliary passages, all of which contained eggs of the round-worm. On section one of the largest stones contained a filament  $1\frac{1}{2}$  inches long which proved to be a small ascaris. Pasley reports a similar case of a native boy, aged 12, on whom he operated for obstructive jaundice caused by biliary calculi. He states: "A curious cylindrical body was at once noticed in the centre of this stone, which on subsequent examination proved to be a portion of an ascaris worm."

Table II calls for little comment except the constant feature of the association of intestinal infestation with the parasite and symptoms referable to the gall-bladder. Morton in his summary calls attention to this point; he states: "These two constant features of the cases do not assure the diagnosis, but when elicited they should at least lead one to bear in mind the possibility of ascariasis of the gall-bladder."

#### *Conclusion.*

1. A case of ruptured empyema of the gall-bladder is reported at an early age.

2. The child had no previous illness usually associated with gall-bladder infections with the exception of ascariasis.

3. The number of worms generally found is two; the passing of four in this case would suggest the possible presence and migration of others.

4. Aviles (see above) has pointed out that the worms may carry infection and also cause obstruction in a hollow viscus. It is suggested that in the present case one or more migrated to the biliary tract, causing obstruction of the

cystic duct and subsequent infection in the gall-bladder. Although neither ova nor worms were found, it is probable that if they were present they would have undergone disintegration in the pus.

5. In view of the numerous cases reported in which small worms have been found in the common duct, we would advise that the common duct be opened and examined in all cases of gall-bladder disease associated with *Ascaris lumbricoides*.

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## CONTROLLABLE SPINAL ANAESTHESIA:

## SOME RECENT EXPERIENCES WITH SPINOCAIN SPINAL ANAESTHESIA.

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STIMULATED by the experience of several American surgeons who have been using spinocain spinal anaesthesia with success, and by the statement by Dr. Frank A. Kelly<sup>1</sup> that "all textbooks on spinal anaesthesia will have to be rewritten, as a result of the epochal work of Dr. George Pitkin," we decided to try spinocain in a varied number of cases at the Norfolk and Norwich Hospital, and to investigate the advantages claimed for this anaesthetic by Drs. Pitkin and Kelly at the recent meeting of the British Medical Association at Manchester.

All the cases were under the charge of Sir Hamilton Ballance, senior surgeon to the hospital. We have used spinocain in thirty-four cases in all. With the exception of the first one or two we have been agreeably impressed by the anaesthesia obtained and particularly by the comparative absence of toxic symptoms, noticeably of any serious degree of shock and other post-operative complications. Almost all the cases have suffered from some pulmonary, cardiac, or other complication contraindicating a general anaesthetic, and a few have been in such a serious condition that the operation would have been associated with serious risk if performed under general anaesthesia. Our

experience has been confined to adults—eighteen females and sixteen males. We have not yet had any children in which spinal anaesthesia was indicated.

## List of Cases.

1. Male, aged 65. Intestinal obstruction due to peritoneal bands.
2. Female, aged 19. Skin graft of leg.
3. Male, aged 68. Strangulated inguinal hernia (radical cure).
4. Female, aged 37. Intestinal obstruction (caecostomy).
5. Female, aged 35. Amputation of cervix.
6. Male, aged 44. Cystoscopy.
7. Male, aged 33. Skin graft.
8. Female, aged 72. Appendix abscess.
9. Male, aged 65. Right-sided colectomy for neoplasm of caecum.
10. Male, aged 62. Extensive anal fistula.
11. Female, aged 24. Carcinoma of stomach (jejunostomy).
12. Male, aged 78. Suprapubic prostatectomy.
13. Male, aged 23. Manipulation of Pott's fracture, and plaster.
14. Female, aged 36. Myomectomy.
15. Female, aged 49. Cholecystectomy.
16. Male, aged 59. Sliding bone graft of tibia.
17. Female, aged 60. Strangulated femoral hernia (resection of small intestine).
18. Male, aged 35. Psoas abscess.
19. Male, aged 73. Suprapubic prostatectomy.
20. Female, aged 50. Colpoperineorrhaphy.
21. Male, aged 63. Radical cure of inguinal hernia.
22. Female, aged 18. Lengthening of tendo Achillis.
23. Female, aged 55. Cholecystectomy and appendicectomy.
24. Female, aged 54. Subphrenic abscess and suppurative cholecystitis.
25. Female, aged 23. Hammer-toes.
26. Female, aged 41. Cholecystectomy and choledochotomy.
27. Female, aged 50. Subtotal hysterectomy.
28. Male, aged 62. Reduction of fracture tenotomy of tendo Achillis.
29. Male, aged 55. Fistula in ano.
30. Female, aged 54. Tumour of colon (colostomy).
31. Male, aged 55. Double inguinal hernia.
32. Male, aged 70. Suprapubic prostatectomy.
33. Female, aged 52. Carcinoma of colon (right-sided colectomy).
34. Female, aged 47. Strangulated femoral hernia.

It will be seen from the above list that the cases, if not numerous, are at least varied, and in every case but one we were able to perform the operation without the aid of a general anaesthetic and without undue anxiety about the patient's condition.

The longest period of anaesthesia was in a male aged 65 (Case 9). The patient had severe myocarditis, but though the operation lasted two and a half hours he stood it well. He died nine days later from a heart attack. Another case which shows well the length of anaesthesia which can be expected is No. 17. The patient had a strangulated femoral hernia of four days' duration, and the operation, involving resection of gut and radical cure of hernia, lasted two hours and five minutes. This patient was in a very serious condition on admission, yet she gave no anxiety during the operation. These two cases and others in which the operation lasted over two hours serve to show that, provided sufficient spinocain is given, there need be no fear of the anaesthesia passing off.

In the above list there have been three deaths, none of which could be attributed to the anaesthetic. There has been no case of severe post-operative toxic symptoms. A few patients have vomited a little during the first twelve hours, and several have complained of slight headache and stiffness in the posterior muscles of the neck; apart from these, the convalescence has been smooth, and almost all who have experienced a general anaesthetic previously declare their preference for the spinal anaesthetic.

In our first few cases, while we had 100 per cent. successes in operations upon the perineum and lower extremities, there was considerable difficulty in gaining anaesthesia above the umbilicus sufficient for an abdominal operation of any length. This difficulty has, however, been easily overcome, as will be shown later.

Spinocain appears to have a selective action, the patient feeling some vague sensations of touch, but yet not complaining of any pain. Sensory fibres conveying temperature and touch are undoubtedly less affected than those conveying pain, the latter being completely paralysed along with all motor nerves below the spinal block.